

What is claimed is:

1. An electrochemical cell, which comprises:
  - a) a casing comprising a curved wall extending to an opening closed by a lid;
  - b) a negative electrode comprising a plurality of anode face portions joined by anode connecting portions, wherein the anode face portions and at least one of the anode connecting portions support a negative electrode active material of an alkali metal;
  - c) a positive electrode comprising a plurality of cathode face portions joined by cathode connecting portions, wherein the cathode face portions and at least one of the cathode connecting portions support a cathode active material which intercalates with the alkali metal, and wherein the negative electrode and positive electrode are electrochemically associated with each other as an electrode assembly in the casing such that a periphery of the anode and cathode face portions substantially follows a contour of the curved wall of the casing;
  - d) a separator disposed between the negative electrode and the positive electrode; and
  - e) an electrolyte solution activating the negative and positive electrodes.
2. The electrochemical cell of claim 1 wherein the anode and cathode electrodes are unitary members.

3. The electrochemical cell of claim 1 wherein one of the anode and the cathode electrodes is provided in two sections and the other electrode is a unitary member and a first one of the sections is aligned with a first side of the other electrode and a second one of the sections is aligned with a second side of the other electrode.

4. The electrochemical cell of claim 1 wherein the anode and cathode face portions have at least one side formed in the shape of a curved surface.

5. The electrochemical cell of claim 1 wherein the anode and cathode face portions comprising the negative and positive electrodes increase in size from those disposed in a middle position of the electrode assembly to an outer position thereof.

6. The electrochemical cell of claim 1 wherein the anode and cathode connecting portions increase in length from a first end of the respective anode and cathode electrodes to an opposite end thereof.

7. The electrochemical cell of claim 1 wherein the negative and positive electrodes are wound to form the electrode assembly.

8. The electrochemical cell of claim 1 wherein there is either one more anode face portion than cathode face portions or one more cathode face portion than anode face portions and the cell is either in a case-negative or a case-positive design, respectively.

9. The electrochemical cell of claim 1 wherein there is an equal number of cathode face portions and anode face portions and the cell is in either a case-positive or a case-negative design.

10. The electrochemical cell of claim 1 wherein casing comprises opposed generally planar face walls extending to the curved wall intermediate the face walls.

11. An electrochemical cell, which comprises:

- a) a casing comprising opposed generally planar face walls extending to a curved wall intermediate the face walls and extending to an opening closed by a lid;
- b) a negative electrode comprising a plurality of anode face portions joined by anode connecting portions, wherein the anode face portions and at least one of the anode connecting portions support a negative electrode active material of an alkali metal;
- c) a positive electrode comprising a plurality of cathode face portions joined by cathode connecting portions, wherein the cathode face portions and at least one of the cathode connecting portions support a cathode active material which intercalates with the alkali metal, and wherein the negative electrode and positive electrode are electrochemically associated with each other as an electrode assembly in the casing with the anode and cathode face portions aligned generally parallel to the opposed face walls while a periphery of the

- anode and cathode face portions substantially follows a contour of the curved wall of the casing;
- d) a separator disposed between the negative electrode and the positive electrode; and
  - e) an electrolyte solution activating the negative and positive electrodes.

12. The electrochemical cell of claim 11 wherein the largest negative and positive face portions are disposed in the center of the electrode assembly and the other negative and positive face portions disposed on opposite sides of the largest positive face portions become gradually smaller as the distance from the largest negative and positive face portions increases

13. A method of assembling a cell stack for an electrochemical cell, comprising:

- a) providing a casing comprising opposed generally planar face walls extending to a curved wall intermediate the face walls;
- b) providing a negative electrode comprising a plurality of anode face portions joined by anode connecting portions, wherein the anode face portions and at least one of the anode connecting portions support a negative electrode active material of an alkali metal
- c) providing a positive electrode comprising a plurality of cathode face portions joined by cathode connecting portions, wherein the cathode face portions and at least one of the cathode connecting portions support a cathode active

material which is intercalatable with the alkali metal;

- d) placing the negative electrode and positive electrode adjacent to one another such that the anode face portions and anode connecting portions are aligned with the cathode face portions and the cathode connecting portions;
- e) providing a separator disposed between the negative electrode and the positive electrode; and
- f) winding a first set of the anode and cathode face portions on top of a second set of the anode and cathode face portions to provide an electrode assembly having the negative electrode and positive electrode electrochemically associated with each other; and
- g) housing the electrode assembly in the casing such that a periphery of the anode and cathode face portions substantially follows a contour of the curved wall of the casing; and
- h) closing the open end of the casing with a lid and activating the electrode assembly with an electrolyte.

14. The method of claim 13 wherein the anode and cathode electrodes are unitary members.

15. The method of claim 13 wherein one of the anode and the cathode electrodes is provided in two sections and the other electrode is a unitary member and a first one of the sections is aligned with a first side of the other electrode and a second one of the sections is aligned with a second side of

the other electrode before the electrodes are wound to provide the electrode assembly.

16. The method of claim 13 including providing one more anode face portion than cathode face portion and providing the electrode assembly begins by winging the one anode face portion on top of a cathode face portion.

17. The method of claim 13 including providing an equal number of cathode face portions and anode face portions and the cell is in either a case-positive or a case-negative design.

18. The method of claim 13 including increasing the anode and cathode connecting portions in length from a first end of the respective anode and cathode electrodes to an opposite end thereof.